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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,377	12/20/2001	Ryuji Kondo	107317-00038	5506

4372 7590 12/01/2004

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EXAMINER

HERNANDEZ, NELSON D

ART UNIT PAPER NUMBER

2612

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/022,377	Applicant(s) KONDO ET AL.	
	Examiner Nelson D. Hernandez	Art Unit 2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 20 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 6-9, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe, US Patent 6,522,356 B1 in view of Nakazato, US Patent 5,592,575.

Regarding claim 1, Watanabe discloses a solid-state image pickup apparatus (Figs. 7, 9, 13 and 15) comprising: a solid state image pickup device having a number of color pixels disposed in a plurality of rows and columns in a pixel shift layout (See figs. 1A, 1B and 1C) and generating and outputting pixel signals, said number of color pixels including at least three kinds of color pixels, color pixels of one of said at least three kind being distributed in a square lattice pattern (See figs. 1C, 7, 9, 13 and 15) aligned in row and column directions (Col. 6, lines 1-32; col. 8, lines 1-26 and lines 45-64; col. 11, lines 28-61; col. 13, lines 16-51). Watanabe does not explicitly disclose a first signal processing unit for generating output pixel signals by using signals based on said pixel signals, said first signal processing unit generating a part of output pixel signals directly from signals based on pixel signals of the color pixels of said one kind and generating another part of output pixel signals through interpolation process using signals based on pixel signals of color pixels of another of said at least three kinds.

However, Nakazato teaches an solid state image pickup device having a number of color pixels disposed in a plurality of rows and columns in a pixel shift layout (See fig. 2) and generating and outputting pixel signals, said number of color pixels including at least three kinds of color pixels (Red, Green and Blue, see fig. 2) wherein said device comprises an image processing circuit (Fig. 1: 5) which performs an interpolation process to obtain the value of the color pixel different from the pixel in certain location (i.e. calculating a red or blue pixel in a green pixel location) (Col. 4, lines 16-38; col. 5, lines 16-26). Generating a part of output pixel signals directly from signals based on pixel signals of the color pixels of one kind is inherent in Nakazato since the colors that do not need to be calculated are transfer directly from the image sensor.

Therefore, taking the combined teaching of Watanabe in view of Nakazato as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Watanabe by having a signal processing unit for generating output pixel signals by using signals based on the pixel signals, said signal processing unit generating a part of output pixel signals directly from signals based on pixel signals of the color pixels of said one kind and generating another part of output pixel signals through interpolation process using signals based on pixel signals of color pixels of another of said at least three kinds. The motivation to do so would enable the solid-state image pickup apparatus to form high-resolution images as suggested by Nakazato (Col. 4, lines 16-38).

Regarding claim 2, Watanabe discloses that the at least three kinds of color pixels are red color pixels, green color pixels and blue color pixels (See figs. 1C, 7, 9,

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13 and 15) (Col. 6, lines 1-32; col. 8, lines 1-26 and lines 45-64; col. 11, lines 28-61; col. 13, lines 16-51).

Regarding claim 4, Watanabe teaches the same as in claim 2. Therefore, grounds for rejecting claim 2 apply here.

Regarding claim 6, the combination of Watanabe in view of Nakazato teaches the same as in claim 1. Therefore, grounds for rejecting claim 1 apply here.

Regarding claim 7, the combination of Watanabe in view of Nakazato teaches that the signal-processing unit performs interpolation processes by using signals based on pixel signals of two color pixel rows sandwiching one color pixel row and generates output pixel signals for a reproduction pixel row in a reproduction image corresponding to the sandwiched one color pixel row (See Nakazato, col. 4, lines 16-38).

Regarding claim 8, Watanabe teaches that two color pixels of another kind and two color pixels of the other kind are distributed for each of color pixels of said one kind thereabout respectively (See figs. 1C, 7, 9, 13 and 15) (Col. 6, lines 1-32; col. 8, lines 1-26 and lines 45-64; col. 11, lines 28-61; col. 13, lines 16-51).

Regarding claim 9, Watanabe teaches that each two color-pixels of a same kind are disposed with an associated color pixel of said one kind intervening there between (See figs. 1C, 7, 9, 13 and 15) (Col. 6, lines 1-32; col. 8, lines 1-26 and lines 45-64; col. 11, lines 28-61; col. 13, lines 16-51).

Regarding claim 12, Watanabe teaches a vertical charge transfer element (Figs. 7: 4, 9: 4, 13: 4 and 15: 4) provided for each color pixel column, each said vertical charge transfer element being electrically connected to each color pixel of a

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corresponding color pixel column (Col. 8, lines 1-26 and lines 45-64; col. 11, lines 28-61; col. 13, lines 16-51).

Regarding claim **13**, Watanabe teaches a horizontal charge transfer element (Figs. 7: 5, 9: 5, 13: 5 and 15: 5) electrically connected to each vertical charge transfer element (Figs. 7: 4, 9: 4, 13: 4 and 15: 4) and an output amplifier (Figs. 7: 8, 9: 8, 13: 8 and 15: 8) electrically connected to the horizontal charge transfer element (Col. 8, lines 1-26 and lines 45-64; col. 11, lines 28-61; col. 13, lines 16-51).

3. Claims **3** and **5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe, US Patent 6,522,356 B1 in view of Nakazato, US Patent 5,592,575 and further in view of Shiraishi, US Patent 5,280,347.

Regarding claim **3**, the combination of Watanabe in view of Nakazato fail to teach that at least three kinds of color pixels include complementary color pixels.

However, Shiraishi teaches a color image-sensing device (Fig. 9) comprising a solid state image pickup device (Fig. 9: 1) having a number of color pixels disposed in a plurality of rows and columns in a pixel shift layout (Fig. 7) and generating and outputting pixel signals, said number of color pixels including at least three kinds of color pixels, wherein said at least three kinds of color pixels include complementary color pixels (Cyan, Yellow, Magenta and Green; see fig. 7) (Col. 6, lines 18-34).

Therefore, taking the combined teaching of Watanabe in view of Nakazato and further in view of Shiraishi as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the solid state image pickup apparatus by having a solid state image pickup device having a number of color pixels

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disposed in a plurality of rows and columns in a pixel shift layout and generating and outputting pixel signals, said number of color pixels including at least three kinds of color pixels, wherein said at least three kinds of color pixels include complementary color pixels. The motivation to do so would help the solid-state image pickup device to increase the amount of light passing through to the sensor, providing better efficiency compared to a RGB system.

Regarding claim 5, the combination of Watanabe in view of Nakazato and further in view of Shiraishi teaches that color pixels of said one kind are green color pixels (See Shiraishi, fig. 7, col. 6, lines 18-34).

4. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe, US Patent 6,522,356 B1 in view of Nakazato, US Patent 5,592,575 and further in view of Horng, US Patent 5,663,759.

Regarding claim 10, the combination of Watanabe in view of Nakazato fails to teach a second signal processing unit for generating output pixel signals by performing interpolation processes using signals based on pixel signals of said number of color pixels.

However, Horng teaches a processor (Fig. 1) for a digital camera comprising a first signal processing circuit (Fig. 1: 30) and second signal processing unit (Fig. 1: 40) for generating output pixel signals by performing interpolation processes using signals based on pixel signals of said number of color pixels (Col. 2, line 51 – col. 3, line 6; col. 3, lines 21-52; col. 4, lines 12-48).

Therefore, taking the combined teaching of Watanabe in view of Nakazato and further in view of Horng as a whole, it would have been obvious to one of ordinary skill in the art to modify the solid-state image pickup apparatus by having a second signal processing unit (Fig. 1: 40) for generating output pixel signals by performing interpolation processes using signals based on pixel signals of said number of color pixels. The motivation to do so would help the solid-state image pickup apparatus to produce full picture zoom, partial picture zoom, still picture, and mosaic functions as suggested by Horng (Col. 1, lines 47-57).

Regarding claim 11, the combination of Watanabe in view of Nakazato and further in view of Horng teaches that the second signal processing unit generates output pixel signals corresponding to a reproduction image having the number of reproduction pixels larger than the total number of said color pixels as in claim 10. Therefore, grounds for rejecting claim 10 apply here.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernandez whose telephone number is (703) 305-8717. The examiner can normally be reached on 8:30 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nelson D. Hernandez
Examiner
Art Unit 2612

NDHH
November 22, 2004



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PRIMARY EXAMINER